



SLOVENSKI STANDARD SIST ETS 300 690 E1:2005

01-februar-2005

**Poslovne telekomunikacije (BTC) - Digitalni zakupljeni vodi za prenosno hitrost
140 Mbit/s (D140U, D140S) - Vmesnik terminalske opreme**

Business TeleCommunications (BTC); 140 Mbit/s digital leased lines (D140U and
D140S); Terminal equipment interface

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Ta slovenski standard je istoveten z: ETS 300 690 Edition 1
SIST ETS 300 690 E1:2005
<https://standards.iteh.ai/catalog/standards/sist/4d22d2d0-1e80-468b-86fe-6529a6203e94/sist-ets-300-690-e1-2005>

ICS:

33.040.50	Vodi, zveze in tokokrogi	Lines, connections and circuits
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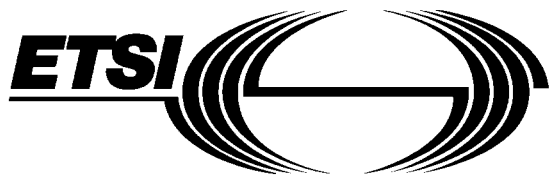
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EUROPEAN TELECOMMUNICATION STANDARD

ETS 300 690

December 1996

Source: ETSI TC-BTC

Reference: DE/BTC-02058

ICS: 33.040.40

Key words: Access, digital, interface, leased line, ONP, terminal

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Business TeleCommunications (BTC);
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140 Mbit/s digital leased lines (D140U and D140S);
Terminal equipment interface

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Business Telecommunications (BTC) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS resulted from a mandate from the Commission of the European Community (CEC) to provide harmonized standards for the support of the Directive on Open Network Provision (ONP) of leased lines (92/44/EEC).

There are two other standards directly related to this ETS:

- ETS 300 686: "Business Telecommunications (BTC); 34 Mbit/s and 140 Mbit/s digital leased lines (D34U, D34S, D140U and D140S); Network interface presentation";
- ETS 300 688: "Business Telecommunications (BTC); 140 Mbit/s digital leased lines (D140U and D140S); Connection characteristics".

Transposition dates	
Date of adoption	6 December 1996
Date of latest announcement of this ETS (doa):	31 March 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 September 1997
Date of withdrawal of any conflicting National Standard (dow):	30 September 1997

This ETS is based on information from ITU-T Recommendations and ETSI publications and the relevant documents are quoted where appropriate.

Introduction

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The Council Directive on the application of ONP to leased lines (92/44/EEC) concerns the harmonization of conditions for open and efficient access to, and use of, the leased lines provided over public telecommunications networks, and the availability throughout the European Union of a minimum set of leased lines with harmonized technical characteristics.

The 140 Mbit/s unstructured and structured leased lines are not part of the minimum set of leased lines under the leased line Directive, however these standards are being written with the intention that where 140 Mbit/s leased lines are offered, they will be in accordance with these harmonized standards.

Two classes of standard will be used for the interfaces of terminal equipment designed for connection to the ONP leased lines. European Telecommunication Standards (ETs), which are voluntary, give the full technical specifications for these interfaces, whereas Technical Basis for Regulations (TBRs) give the essential requirements under the Second Phase Directive (91/263/EEC) for attachment to the leased lines. The TBR (TBR 25) will be a subset of the corresponding ETS. This standard, which is an ETS, belongs to the first category.

ETS 300 166 and ITU-T Recommendation G.703 [5] are used as the basis for the terminal equipment interface.

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1 Scope

This ETS specifies the full mechanical and electrical characteristics, the necessary functional characteristics and the corresponding conformance tests for a terminal equipment interface for:

- connection to the network termination points of 139 264 kbit/s digital unstructured leased lines (D140U); and
- connection to the network termination points of 139 264 kbit/s digital structured leased lines (D140S) which support an unstructured 138 240 kbit/s information transfer rate.

These leased lines are defined in ETS 300 686 and ETS 300 688.

This ETS is not written for regulatory purposes.

This ETS is written only to ensure that the interface of the terminal equipment is compatible with the 140 Mbit/s digital unstructured or structured leased lines. This ETS is applicable to all interfaces designed for connection to the leased line, however in the cases of apparatus that carries a particular service, of complex apparatus and of apparatus in private networks, other ETSs may apply in addition to this ETS.

Customer premises wiring and installation between the terminal equipment and the Network Termination Point (NTP) are outside the scope of this ETS.

2 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of any of these publications apply to this ETS only when incorporated into it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] EN 60950 (1992): "Safety of information technology equipment including electrical business equipment"
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- [2] IEC 169-8 (1978): "Radio frequency connectors; Part 8: R.F. coaxial connectors with inner diameters of outer conductor 6,5 mm (0,256 in) with bayonet lock - Characteristic impedance 50 ohms (Type BNC)".
- [3] IEC 169-13 (1976): "Radio frequency connectors; Part 13: R.F. coaxial connectors with inner diameter of outer conductor 5,6 mm (0,22 in) - Characteristic impedance 75 ohms (Type 1,6/5,6) - Characteristic impedance 50 ohms (Type 1,8/5,6) with similar mating dimensions".
- [4] ISO/IEC 10173 (1991): "Information technology - Integrated Services Digital Network (ISDN) primary access connector at reference points S and T".
- [5] ITU-T Recommendation G.703 (1991): "Physical/electrical characteristics of hierarchical digital interfaces".
- [6] ITU-T Recommendation O.151 (1992): "Error performance measuring equipment for digital systems at the primary rate and above".
- [7] ITU-T Recommendation O.171 (1992): "Timing jitter measuring equipment for digital systems".

NOTE: This ETS also contains a number of informative references which have been included to indicate the sources from which various material has been derived, hence they do not have an associated normative reference number. Details of these publications are given in annex E. In some cases the same publication may have been referenced in both a normative and an informative manner.

3 Definitions and abbreviations

For the purposes of this ETS, the following definitions apply:

3.1 Definitions

frame: A repetitive set of consecutive bits in which the position of each bit can be identified by reference to a frame alignment signal.

frame alignment signal: The distinctive signal inserted in every frame always occupying the same relative position within the frame and used to establish and maintain frame alignment.

leased lines: The telecommunications facilities provided by a public telecommunications network that provide defined transmission characteristics between network termination points and that do not include switching functions that the user can control, (e.g. on-demand switching).

Network Termination Point (NTP): All physical connections and their technical access specifications which form part of the public telecommunications network and are necessary for access to and efficient communication through that public network.

PRBS(2²³⁻¹): A Pseudo Random Bit Sequence (PRBS) (as defined in subclause 2.2 of ITU-T Recommendation O.151 [6]).

Safety Extra-Low Voltage (SELV) circuit: A secondary circuit which is so designed and protected that under normal and single fault conditions, the voltage between any two accessible parts and, for class 1 equipment, between any accessible part and the equipment protective earthing terminal does not exceed a safe value (subclause 1.2.8.5 of EN 60950 [1]).

terminal equipment: Equipment intended to be connected to the public telecommunications network, i.e.:

- to be connected directly to the termination of a public telecommunication network; or
- to interwork with a public telecommunications network being connected directly or indirectly to the termination of a public telecommunications network;

in order to send, process, or receive information.

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

AIS	Alarm indication Signal
ASCII	American Standard Code for Information Interchange
ATM	Asynchronous Transfer Mode
BIP-8	Bit Interleaved Parity (8 bit)
BNC	Bayonet Nut Connector
CMI	Coded Mark Inversion
CRC-7	Cyclic Redundancy Check (7 bit)
dc	direct current
D140S	140 Mbit/s digital structured leased line
D140U	140 Mbit/s digital unstructured leased line
EM	Error Monitoring
EMC	ElectroMagnetic Compatibility
ETS-RT	ETS Requirements Table
FA1	Frame Alignment byte 1
FA2	Frame Alignment byte 2
GC	General purpose Communications channel
LOF	Loss Of Frame
LOS	Loss Of Signal
LSB	Least Significant Bit
MA	Maintenance and Adaptation
MSB	Most Significant Bit

NR	Network operator byte
NTP	Network Termination Point
ONP	Open Network Provision
ppm	parts per million
PRBS	Pseudo Random Bit Sequence
RDI	Remote Defect Indication
REI	Remote Error Indication
RX	RX is a signal input (at either the terminal equipment or the test equipment, see figure 1)
SDH	Synchronous Digital Hierarchy
SELV	Safety Extra-Low Voltage
TM	Timing Marker
TR	TRail trace
TTI	Trail Trace Identifier
TU	Tributary Unit
TUG	Tributary Unit Group
TX	TX is a signal output (at either the terminal equipment or the test equipment, see figure 1)
UI	Unit Interval

4 Requirements

The D140U 139 264 kbit/s unstructured leased line provides a bi-directional point-to-point digital leased line for the support of an unstructured 139 264 kbit/s information transfer rate. Any structuring of the data is the responsibility of the user.

The D140S 139 264 kbit/s structured leased line provides a bi-directional point-to-point digital leased line for the support of an unstructured 138 240 kbit/s information transfer rate. Any structuring of the data within the transparent 138 240 kbit/s part of the frame is the responsibility of the user.

For both D140U and D140S the provision of timing is the responsibility of the user; however, in certain installations the leased line provider may be able to offer a leased line that is synchronized to the network.

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4.1 Mechanical characteristics

The terminal equipment shall provide at least one of the methods of connection given in subclauses 4.1.1 and 4.1.2.

NOTE 1: When connecting the terminal equipment to the NTP, any difference in ground potential between the two equipments may produce a voltage across the signal ground connection and may cause damage. See DEN/EE-02004 for details of earthing requirements within the customer's premises.

NOTE 2: The transmit pair is the output from the terminal equipment interface. The receive pair is the input to the terminal equipment interface, as shown in figure 1. Where the terms "output" and "input" are used without qualification in this ETS, they refer to the terminal equipment interface.

NOTE 3: Normal practice is for the outer conductors of the input and output connectors to be connected via a dc path to the signal ground and thence to ground. This connection is to reduce EMC emissions. If there is a difference in ground potential between the terminal equipment and the NTP, this arrangement may result in high currents in the outer conductors and cause damage.

To prevent this problem, dc isolation may be introduced between the terminal equipment and the NTP, for example by introducing dc isolation between the outer conductor and the signal ground in the terminal equipment. Careful attention should be given to the requirements of standards on installation earthing practice.

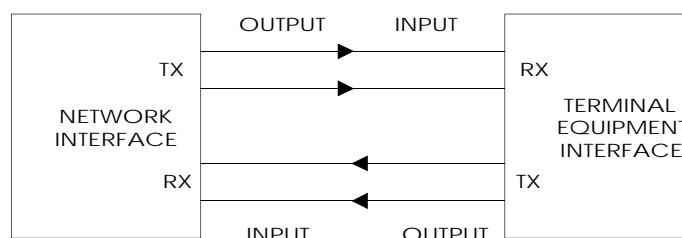


Figure 1

4.1.1 Sockets

Requirement: The terminal equipment interface shall provide two coaxial 75 Ω sockets, one each for transmit and receive; these sockets being either:

- 75 Ω sockets (type 1,6/5,6) complying with IEC 169-13 [3]; or
- 75 Ω BNC sockets complying with the general requirements of IEC 169-8 [2] with the mating dimensions specified in annex B of ISO/IEC 10173 [4].

The outer conductor of the coaxial pair shall be connected to signal ground both at the input port and at the output port.

Test: There shall be a visual inspection that the sockets are of the correct type.

4.1.2 Plugs

Requirement: The terminal equipment interface shall provide two coaxial 75 Ω plugs at the end of a cord (or cords), one each for transmit and receive; these plugs being either:

- 75 Ω plugs (type 1,6/5,6) complying with IEC 169-13 [3]; or
- 75 Ω BNC plugs complying with the general requirements of IEC 169-8 [2] with the mating dimensions specified in annex B of ISO/IEC 10173 [4].

The outer conductor of the coaxial pair shall be connected to signal ground both at the input port and at the output port.

NOTE: There is no requirement on the method of connection of the cord (or cords) to the terminal equipment.

Test: There shall be a visual inspection that the plugs are of the correct type.

4.2 Electrical characteristics

4.2.1 Output port

4.2.1.1 Signal coding

Requirement: The signal transmitted at the output port shall comply with the Coded Mark Inversion (CMI) encoding rules (see annex B).

Test: The test shall be conducted according to subclause A.2.1.

4.2.1.2 Waveform shape

Requirement: The pulse at the output port shall comply with the requirements given in figures 2 and 3 and table 1; based on ITU-T Recommendation G.703 [5].